

**PREGNANCY OUTCOMES AND FACTORS ASSOCIATED WITH
INADEQUATE ANTENATAL CARE VISITS AMONG WOMEN
DELIVERING AT SINZA HOSPITAL, DAR ES SALAAM TANZANIA**

Daniel Simon Luguli (MD)

**MMED Obstetrics and Gynaecology Dissertation
Muhimbili University of Health and Allied Sciences
October, 2020.**

**Muhimbili University of Health and Allied Sciences
Department of Obstetrics & Gynaecology**



**PREGNANCY OUTCOMES AND FACTORS ASSOCIATED WITH
INADEQUATE ANTENATAL CARE VISITS AMONG WOMEN
DELIVERING AT SINZA HOSPITAL, DAR ES SALAAM TANZANIA.**

By

Daniel Simon Luguli.

**A Dissertation Submitted in Partial Fulfilment of the Requirements for the
Degree of Master Medicine in Obstetrics and Gynaecology of
Muhimbili University of Health and Allied Sciences.**

October, 2020.

CERTIFICATION

The undersigned certifies that she has read and hereby recommends for acceptance of dissertation entitled ‘ ‘ *Pregnancy outcomes and factors associated with inadequate antenatal care visits among women delivering at Sinza hospital, Dar es salaam Tanzania* ’ ’ in partial fulfilment of the requirements for the degree of Master of Medicine in Obstetrics and Gynecology of Muhimbili University of Health and Allied Sciences.

Dr Belinda Stella Balandya

(Supervisor)

Date

DECLARATION AND COPYRIGHT

I, **Daniel Simon Luguli**, declare that this **dissertation** is my own original work and that has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature _____ Date _____

This dissertation is a copyright material that is protected under the Berne Convention, the Copyright Act 1999 and other national and international enactments, in that behalf, on intellectual property. It may not be reproduced by any means, in full or in part, except for short extracts in fair dealing, for research or private study, critical scholarly review or discourse with an acknowledgement, without the written permission of the Directorate of Postgraduate Studies, on behalf of both the author and the Muhimbili University of Health and Allied Sciences.

ACKNOWLEDGMENT

Glory and Praise be to the Almighty God for the many blessings throughout my academic life.

Sincere gratitude to my supervisor, Dr Belinda Balandya for her guidance and encouragement to always aim higher and strive for excellence. Her continued tireless advice and inputs from proposal development to report writing and her mentorship is priceless.

To the government of Republic of Tanzania, I am very thankful for the funding of this research work.

I would like to also thank the members of Obstetrics and gynaecology department at MUHAS for their contributions in making this work a success.

A special thanks to the staff members at Sinza Hospital particularly at post natal ward, for making data collection process smooth. Without forgetting the post-delivery women who voluntarily participated in the study, offering their valuable information, without them this study would be incomplete.

Finally, to my family, a stronghold throughout this journey. My dear wife Augustina Malingumu and my beloved sons; Goodluck and Godbless Luguli, for lifting me up even at the darkest of times. My parents (late Mr. Simon Luguli and Anjelina Muhumba), my sisters and in-laws for their continued support and prayers.

DEDICATION

This dissertation is dedicated to my dear wife and sons, sisters, brothers and friends for their continued close support in completion of this work, thanks so much, may God bless you all.

TABLE OF CONTENTS

CERTIFICATION.....	i
DECLARATION AND COPYRIGHT	ii
ACKNOWLEDGMENT	iii
DEDICATION	iv
LIST OF TABLES	vii
LIST OF ABBREVIATIONS	viii
OPERATIONAL DEFINITIONS	ix
ABSTRACT.....	x
1.0 INTRODUCTION.....	1
1.1 Background.	1
1.2. LITERATURE REVIEW.....	3
1.3. CONCEPTUAL FRAMEWORK	6
1.4. PROBLEM STATEMENT	7
1.5. RATIONALE.....	8
1.6. RESEARCH QUESTIONS.....	9
1.7. OBJECTIVES	9
Broad objective:	9
Specific objectives.....	9
2.0 METHODOLOGY.....	10
2.1 Study design	10
2.2 Study duration	10
2.3 Study setting.....	10
2.4 Study population	10
2.5 Study sample	10
2.6 Inclusion criteria.....	11
2.7 Exclusion criteria	11
2.8 Sample size.....	11
2.9 Sample selection.....	11
2.10 Pretesting of study tools	11
2.11 Data collection.....	12

2.12 Variables of the study.....	13
2.13 Data management.....	13
2.14 Data analysis	13
2.15 Ethical issues	14
3.0. RESULTS	15
4.0. DISCUSSION	21
4.1 Study strengths and limitations.	23
5.0. CONCLUSION	24
6. 0. RECOMMENDATIONS	24
REFERENCES.....	25
APPENDICES.....	28
Appendix 1: Consent Form-English Version.....	28
Appendix 2: Questionnaire-English Version	30
Appendix 3: Consent Form Swahili Version	33
Appendix 4: Dodoso	35
Appendix 5: Ethical Clearance.....	38
Appendix 6: Research Permit.....	39

LIST OF TABLES

Table 1: Socio-demographic characteristics of participants N=393.....	15
Table 2: obstetrics characteristics of the participants N=393.....	16
Table 3: Pregnancy outcomes among post-delivery women with inadequate and adequate ANC visits delivering at Sinza hospital, N=393	17
Table 4: Bivariate association for factors associated with inadequate antenatal care visits among women delivering at Sinza hospital, N=393.....	18
Table 5: Multivariate analysis for factors associated with inadequate antenatal care visits among women delivering at Sinza hospital.....	20

LIST OF ABBREVIATIONS

ANC	-	Antenatal Care
AOR	-	Adjusted Odds Ratio
CI	-	Confidence Interval
COR	-	Crude Odds Ratio
FANC	-	Focused Antenatal Care
MUHAS	-	Muhimbili University of Health and Allied Sciences
RCH	-	Reproductive and Child Health
SPSS	-	Statistical Package for Social Sciences
TDHS	-	Tanzania Demographic Health Survey
WHO	-	World Health Organization

OPERATIONAL DEFINITIONS.

Inadequate antenatal care visit is when a post-delivery woman has less than 4 antenatal care visits or started her first antenatal care visit after 16 weeks of pregnancy.

Pregnancy outcomes: include fetal maternal outcomes.

Maternal outcomes: mode of delivery and maternal survival status (alive or death)

Fetal outcomes: delivery outcome (alive or still births) and fetal maturity (preterm or term)

ABSTRACT

Background: The goal of antenatal care (ANC) services is to ensure that every pregnancy ends with delivery of a healthy baby without adversely affecting maternal health. ANC services should begin from early stages of pregnancy. Women can access ANC services by visiting antenatal care clinics. Inadequate ANC visits occurs when a women has made less than 4 ANC visits or started her first ANC visit after 16 weeks of pregnancy. Inadequate ANC visits still a major problem in developing countries and in Tanzania about half of women have inadequate antenatal care visits. This may be associated with poor pregnancy outcomes, high maternal and perinatal mortality. Understanding the factors associated with inadequate antenatal care visits will help to improve pregnancy, maternal and fetal health.

Objective: This study aimed at determining pregnancy outcomes and factors associated with inadequate antenatal care visits among women delivering at Sinza hospital.

Methods: A cross sectional study was conducted at Sinza hospital in Dar es Salaam. A systematic sampling method was used to obtain participants for the study, whereby after every 2 post-delivery women in the day discharge register a woman was selected beginning from the first person to systematically reach sample size of 422 post-delivery women. The principal investigator and one research assistant collected data through Swahili structured questionnaires. Data were coded, entered, cleaned and analysed using SPSS, statistical software version 23. Statistical analysis using descriptive statistics was used to determine the proportion of women with inadequate ANC visits and pregnancy outcomes such as maternal outcomes (mode of delivery, maternal survival status) and fetal outcomes (term or preterm delivery, alive or still births). Bivariate and multivariate logistic regression were done to identify factors associated with inadequate antenatal care visits with a p-value <0.05 considered statistically significant.

Results: 21.1% of women delivering at Sinza hospital had inadequate antenatal care visits. Factors that showed significant association with adequacy antenatal care visits were maternal education level (AOR=4.07, 95% CI=1.31-18.18); number of times husband/partner accompanied his wife/partner to the clinic (AOR=7.04, 95% CI=0.95 – 52.35) and gestational

age at delivery (AOR=2.73, 95% CI=1.3-5.76). There was a significant association of preterm deliveries in women with inadequate antenatal care visits (p-value = 0.012).

Conclusion: Almost one-fifth of women delivering at Sinza hospital had inadequate antenatal care visits. Factors that showed significant association with inadequate antenatal care visits were maternal education, total number of times husband/partner accompanied his wife/partner to the clinic and gestational age at birth. There was a significant association of preterm delivery in women with inadequate antenatal care visits. Women with inadequate ANC visits were two times more likely to deliver preterm babies as compared to women with adequate ANC visits.

1.0 INTRODUCTION

1.1 Background.

According to World Health Organization (WHO), every day around 800 of maternal deaths and more than 2.6 million of stillbirths occur every year from preventable causes (1). Ninety nine percent of all maternal and neonatal deaths occur in developing countries (2). Fifty six percent of global maternal deaths occur in Sub Saharan Africa. About 25 % of all maternal deaths occur during pregnancy (3). Around half of all maternal deaths are due to causes such as hypertension (pre-eclampsia and eclampsia) and antepartum haemorrhage, which are directly related to inadequate prenatal care during pregnancy (3).

Inadequate antenatal care visits is associated with adverse pregnancy outcomes like preterm birth, low birth weight, stillbirths (4). It is estimated that two-thirds of all stillbirths occur in countries with high mortality rate (3). Most of maternal and perinatal deaths occurring in sub Saharan Africa can be prevented, detected and managed through improving and increasing the utilization of maternity care services (5). Maternal care services include care during pregnancy and should begin from the early stages of pregnancy (6). The goal of antenatal care services is to ensure that pregnancy ends with delivery of a healthy baby without adversely affecting maternal health. Women can access antenatal care services by visiting antenatal clinics where ANC services are available.

The maternal deaths for Tanzania are still high at 556 deaths per 100,000 (7). The perinatal deaths for Tanzania are still high, about 51,000 new-borns die and 43,000 stillbirths occur every year (8). Maternal and perinatal deaths result from factors related to pregnancy, childbirth and poor quality of maternal care services (8). High maternal and perinatal deaths reflect inadequate utilization of antenatal care services (9). Adequate antenatal care use during pregnancy has shown to reduce maternal and perinatal mortality, the risk of miscarriage, low birth-weight, premature and still births (10).

Antenatal care helps early detection and treatment of pregnancy-related complications and identification of pregnant women at risk of developing complications (1). It is also a strong factor for good pregnancy outcomes and has a significant effect on maternal and child health (11). Initiation of antenatal care during the first trimester of pregnancy provides an opportunity for timely diagnosis and treatment of several pregnancy-related complications. The WHO recommends that every pregnant woman and new-born receives quality care

throughout the pregnancy, childbirth and the postnatal period (1). Previously WHO recommended a minimum of 4 ANC visits for uncomplicated pregnancy, currently WHO recommends a minimum of 8 contacts; whereas one contact is in first trimester, two contacts in second trimester and five contacts in the third trimester (1). In each contact a pregnant woman should be provided with nutritional advice, alerted on warning or danger signs and given support on planning a safe delivery (12).

The introduction of focused ANC (FANC) in 2002 aimed at integration of care through health promotion, disease prevention, detection and treatment of diseases and birth preparedness (9), leading to an increased use of antenatal care in low- and middle-income countries. However from 2007–2014, only 64% of pregnant women attended the previously WHO-recommended minimum of four visits for ANC globally (1). Antenatal care visits varies across the globe; with minimal, late or no antenatal care use being high in developing countries as compared to developed countries. Inadequate antenatal care use ranges from 25% to 43% in developing countries (13), while that of developed countries on average does not exceed 17%.

In Tanzania, 80% of antenatal care service is primarily provided by nurses and midwives and the rest receive care from doctors, clinical officers, or maternal-child health aides (14). The revised FANC model of Tanzanian recommends at least four ANC visits for uncomplicated pregnancies with the first visit starting during the first trimester. Despite high coverage of ANC services in the country, few women (about 25%) booked antenatal care in the first trimester and half (51%) of women made 4 or more ANC visits. One third of women don't seek ANC until their sixth month of pregnancy or later. Women attending 4 or more ANC visits have increased from 43% to 51% since 2010 (8). Therefore pregnancy outcome depends, to a large extent, on the availability, quality and a woman having adequate antenatal care visits (15). Currently, Tanzania is reviewing FANC guideline so as to adopt the new WHO ANC recommendation of 8 ANC contacts for uncomplicated pregnancy.

1.2. LITERATURE REVIEW

Antenatal care visits varies across the globe; with minimal, late or no antenatal care visit being high in developing countries as compared to developed countries. Inadequate antenatal care visits ranges from 25% to 43% in developing countries (13), while that of developed countries on average does not exceed 17%. A retrospective analytic study done in the USA on the inadequate antenatal care utilization and risks of perinatal deaths and poor birth outcome, found that there was a high risk of prematurity, stillbirths, neonatal deaths and infant deaths to women with inadequate antenatal care visits. The prevalence of inadequate care use was 11.2% occurring more among women ≤ 20 years, black non-Hispanic and Hispanic women, and those without high school education (16). In a population study done in Canada on inadequate antenatal care and its association with adverse pregnancy outcomes, found that high proportion of preterm and low birth weight were more pronounced in women with inadequate or no ANC visits (4). The study done in Brazil found that maternal attitudes were important for adequate antenatal care visits and those with negative attitude were to be encouraged to use ANC (11).

Analytical study done in Paris-France looking at association between inadequate perinatal care utilization and severe perinatal and maternal morbidity; it was found that women with inadequate antenatal care utilization had increased incidence of severe maternal and perinatal morbidity. Late initiation of antenatal care was not associated with severe perinatal or maternal morbidity. It was concluded that inadequate antenatal care utilization is associated with severe maternal and perinatal morbidity, to degrees that vary with the component of care and the outcome considered (17).

In a study done in Finland on the under-attending free antenatal care is associated with adverse pregnancy outcomes observed that women with inadequate ANC visits was associated with pregnancy complications like chorioamnionitis or abruption placenta. And pregnancy outcomes were low birth weight, fetal or neonatal deaths (18). The systematic review done in Netherlands on inadequate antenatal care use among women of high income countries found maternal age, low educational level, ethnic minority, hospital type, unplanned place of delivery, high parity, no previous premature birth and late recognition of pregnancy as individual reasons for inadequate use (19).

A study done in Italy looking at socio-demographic determinants and access to antenatal care; it was observed that unemployed or less educated women had inadequate antenatal care

visits (20). In a comparison study done in Europe between two countries, Belgium and Netherlands, on factors for antenatal care visits in urban areas; it was found that education level and employment status of women were important factor for early initiation of ANC service in both countries (21). A study done in Nepal on the impact of antenatal care on maternal and perinatal outcome, it was found that maternal and fetal complications like anaemia, hypertension and low birth weight and preterm babies were common in women with inadequate or no ANC use respectively (22).

A study done in Karachi-Pakistan, found that socio-demographic and cultural factors influenced use of antenatal care services, such factors were maternal age, number of living children, education, place of residence, occupation, religion and ethnicity are significantly associated with use of antenatal care (23). A systematic review done in Iran on factors for use of antenatal care service found that utilization of antenatal care services could be improved through developing socio economic factors and addressing patients' needs including education and financial independence (24). The study conducted in Osun State Nigeria revealed factors for antenatal care utilization were affordability of antenatal care services, schedule of ANC, unawareness of the ANC services and husband's acceptance (25).

In a study done in Eastern Cape-South Africa, found that late antenatal care initiation was due to women's beliefs, knowledge and perceptions regarding antenatal services (26). In a study done in Ethiopia on the effects of pregnancy intention on use of antenatal care service observed that inadequate ANC use was higher in women with unplanned pregnancy and was associated with adverse maternal and perinatal outcomes (27). Also another study done in Ethiopia found that frequency of antenatal care and place of delivery were predictors of perinatal outcome (28). A similar study done in Zambia on utilization of ANC showed low utilization of ANC due to educational status, decision-making power and income level among women (29).

A study done in Zambia found that late antenatal care visits was high in women with unplanned pregnancies, inadequate knowledge about ANC, cultural beliefs and women who are multiparous (30). In a qualitative study done in Kenya on barriers and facilitators to antenatal care and delivery found that testing for disease including HIV, examining the patient, and receiving injections or medications facilitated utilization of antenatal care services, while staff attitudes, long clinic waiting time, HIV testing and cost to some women were the barriers to antenatal and delivery services (31). Another study done in Uganda

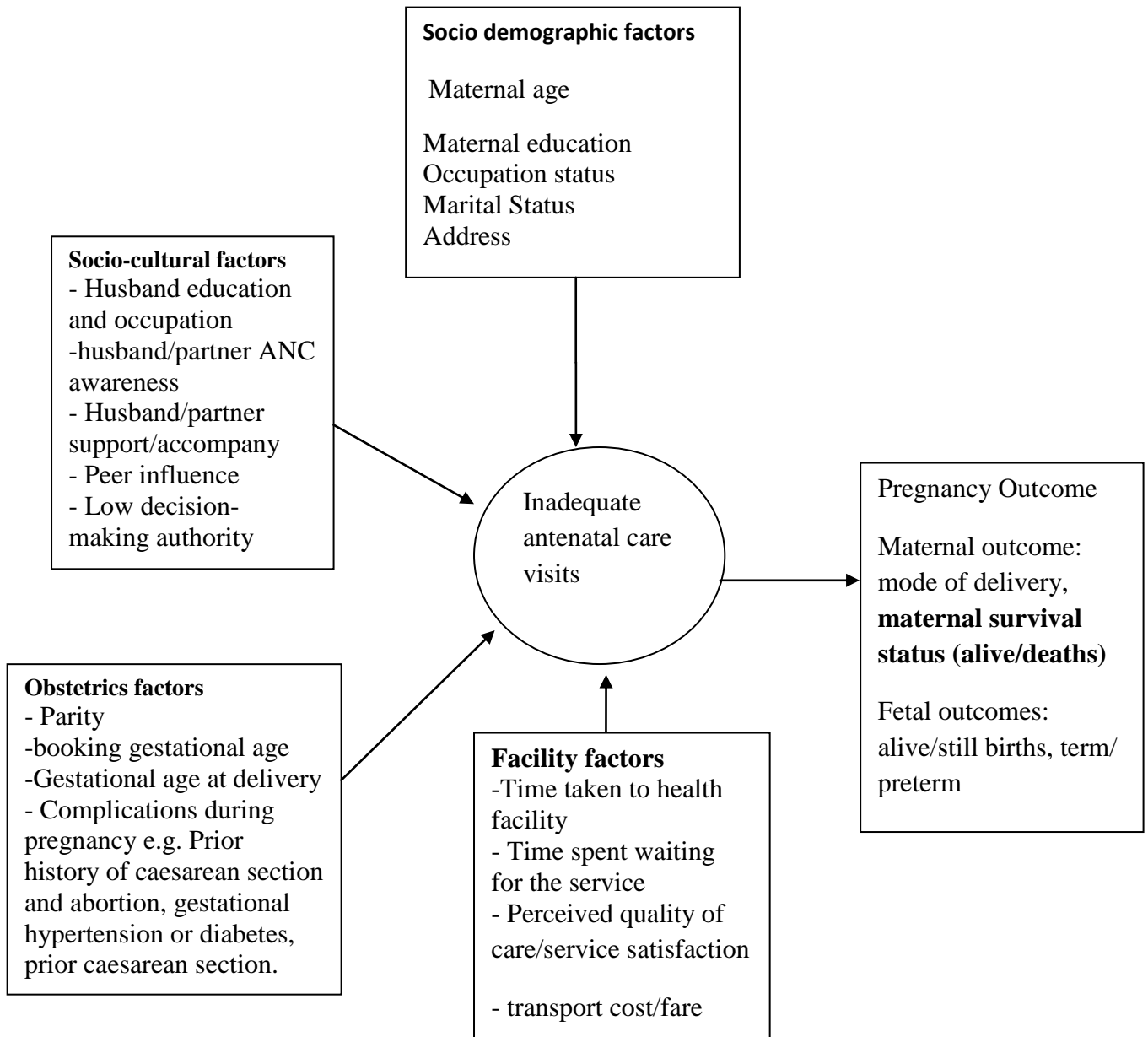
found that despite the high antenatal coverage, still there was inadequate antenatal care utilization due to fear, remoteness, poverty and lack of support from husband/partner (32).

In a study done in Tanzania to identify factors for utilization of antenatal care services observed that quality of services, testing and counselling for HIV during ANC, receiving doses of SP (Sulphadoxine Pyrimethamine) for malaria prevention and higher educational status positively influenced utilization of antenatal services. Whereas maternal age, unmarried woman, long distance to health facility and unplanned pregnancy were the reasons for inadequate antenatal use (33). A study done on the timing for antenatal care at Ulanga and Kilombero in Morogoro- Tanzania found factors that influenced timing of antenatal care such like poor quality of care, unawareness of ANC benefits and late recognition of pregnancy, social and economic status. Primiparity and previous experience of a miscarriage or stillbirth were associated with an early initiation of antenatal care attendance (34). Also another study conducted in Lushoto Tanzania found late initiation of antenatal visit in unmarried and unemployed women (35).

Identifying factors associated with inadequate antenatal care visits is important for policy formulation for improving pregnancy outcomes, maternal and fetal health; as our country, Tanzania, is about to adopt the 8 antenatal care contacts as recommended by the current WHO antenatal guideline for uncomplicated pregnancy. As we have seen from different studies in the literature review section that inadequate ANC visits among women is still a public problem especially in developing countries. Several studies have been carried out mostly in rural areas looking at the factors associated with inadequate ANC use among pregnant women with limited studies in urban areas. This study will help determine pregnancy outcomes and factors associated with inadequate ANC visits among women living in urban areas and give a basis for the policy makers to assess the current situation on ANC services utilization by pregnant women in our country, Tanzania.

1.3. CONCEPTUAL FRAMEWORK

Inadequate antenatal care visits among pregnant women is associated with many factors. In this study, independent factors considered were socio-demographic, socio-cultural, obstetrics and facility factors while dependent factors included were inadequate ANC visits and pregnancy outcomes. Below is a conceptual framework for this study.



A modified conceptual model from Anderson and Newman Model.

1.4. PROBLEM STATEMENT

Tanzania is among sub Saharan countries with high maternal and perinatal mortality. Good and quality antenatal care helps early detection and treatment of pregnancy-related complications and identification of pregnant women at risk of developing complications. Adequate antenatal care visits during pregnancy may help reduce maternal and perinatal mortality and adverse pregnancy outcomes. Nearly all pregnant women receive ANC services from skilled health provider.

Despite high coverage of antenatal care services within the country, still there are inadequate ANC visits among pregnant women. Few women (about 25%) book their ANC visit in the first trimester as per guideline and half (51%) of women make 4 or more ANC visits. One third of women do not seek ANC services until their sixth month of pregnancy or later (8)

As part of the antenatal care quality research, understanding and identifying factors associated with inadequate antenatal care visits and pregnancy outcomes is an important area of study. Knowledge of the factors associated with inadequate antenatal care visits and pregnancy outcomes is a prerequisite for improving maternal and fetal health, and therefore reduction of maternal and perinatal mortality.

Several studies have been done in rural areas on factors for utilization of antenatal care services but limited studies have been done on factors associated with inadequate antenatal visits and pregnancy outcomes among pregnant women especially in urban areas. This study will help determine the factors associated with inadequate antenatal care visits and pregnancy outcomes among women delivering at Sinza hospital.

1.5. RATIONALE

Tanzania is among the countries with high maternal and perinatal mortality and still inadequate antenatal care visits is high despite high coverage of ANC services within the country. The national FANC guideline recommends a minimum of 4 antenatal care visits, with the first visit in the first trimester for uncomplicated pregnancy. Currently, Tanzania is reviewing its national FANC guideline so as to adopt the 8 minimum visits for antenatal care services as recommended by the new WHO antenatal care guideline.

The findings of this study will help address the factors associated with inadequate antenatal care visits and their related pregnancy outcomes; therefore help increase antenatal care visits among pregnant women. This will aid promotion of maternal and fetal health, thereby reducing maternal and fetal mortality. Also the findings could help the policy makers in planning and developing strategies for adequate antenatal care use among pregnant women so as to prevent or reduce adverse pregnancy outcomes, maternal and perinatal deaths.

1.6. RESEARCH QUESTIONS

1. What is the proportion of women with inadequate antenatal care visits delivering at Sinza hospital?
2. What are the pregnancy outcomes among women with inadequate antenatal care visits in women delivering at Sinza hospital?
3. What are the factors associated with inadequate antenatal care visits among women delivering at Sinza hospital?

1.7. OBJECTIVES

Broad objective:

To determine pregnancy outcomes and factors associated with inadequate antenatal care visits among women delivering at Sinza hospital from November to December 2019.

Specific objectives

- i) To determine the proportion of women with inadequate antenatal care visits among women delivering at Sinza hospital
- ii) To determine pregnancy outcomes among women with inadequate antenatal care visits delivering at Sinza hospital.
- iii) To determine factors associated with inadequate antenatal care visits among women delivering at Sinza hospital.

2.0 METHODOLOGY

2.1 Study design

A hospital-based descriptive cross sectional study

2.2 Study duration

Data was collected on daily basis for 5 weeks from 16th November to 24th December, 2019.

2.3 Study setting

This study was conducted at the postnatal ward of Sinza hospital, a public district hospital in Ubungo municipality in Dar es Salaam. The hospital provides maternal and child health care and outpatient services. It serves around 1200 patients per month, in which 75% are obstetric patients. It provides antenatal care, labor, delivery and post-delivery care services. The hospital has RCH clinic whereby among the services provided is focused antenatal care (FANC) services to pregnant women. It implements the revised FANC model of Tanzania that recommends at least four ANC visits for uncomplicated pregnancies with the first antenatal care visit starting before 16 weeks of pregnancy, second visit between 20 to 24 weeks of pregnancy, third visit should be between 28 to 32 weeks of pregnancy and fourth visit should be from 36 weeks of pregnancy. It provides antenatal care services for 5 days per week, Monday to Friday. In each day the clinic serves around 80 to 100. It also provides labor, delivery and postnatal services daily. It has an average of 30 to 40 deliveries per day. The postnatal ward receives average of 30 to 40 post-delivery women from the labor ward daily. It routinely discharges post-delivery women twice per day and around 27 to 35 post-delivery women are discharged per day. The discharges are mostly premature discharges because of congestion in the postnatal ward. The antenatal care, labor, delivery and postnatal services are mainly provided by nurse-midwives, medical doctors and specialist obstetricians/gynaecologists.

2.4 Study population

All post-delivery women in the postnatal ward at Sinza hospital.

2.5 Study sample

All discharged post-delivery women in the postnatal ward at Sinza hospital.

2.6 Inclusion criteria

All discharged post-delivery women in postnatal ward at Sinza hospital.

2.7 Exclusion criteria

All those post-delivery women with mental illness or discharged through other clinics.

2.8 Sample size

From a study done in Tanzania 2010, it was found that about 54.8% of women in urban areas made 4 or more ANC visits (36). Assuming 95% as level of confidence and non-response of 10%. The sample size was calculated using the formula as follows

$$n = \frac{Z^2 P(100 - P)}{\epsilon^2}$$

Where Z=level of confidence, in this study is 95%,

P=proportion (54.8%),

ε=margin error (5%)

$$= \frac{1.96^2 \times 54.8(100 - 54.8)}{5^2} = 380$$

Adjusting for non-response rate 10%

$$= 380 \times \frac{(100)}{100 - 10\%} = 422$$

The estimated sample size was 422

2.9 Sample selection

Participants for the study were obtained through systematic sampling. An average of 27 post-delivery women were discharged per day and a minimum of 12 participants were enrolled each day. Using the discharge register, a study subject was recruited after every 2 post-delivery women. A sampling interval was calculated by dividing the total number of discharges per day by the minimal number of participants required in a day ($27/12=2.25$). The first participant selected randomly from the first two discharged women in the register.

2.10 Pretesting of study tools

Pretesting of the data collection was done over a period of five days. This was done to make necessary adjustments before data collection process. The test was done as a pilot study that involved 21 women meeting the inclusion criteria. Women in the pilot study were excluded in the study sample. Swahili structured questionnaires were used to collect data from the participants who consented for the study.

2.11 Data collection

Data was collected using face to face interview by the principal investigator and one trained research assistant. Recruitment of participants was conducted after postnatal service ward round and study subjects were enrolled systematically from discharge register for a particular day. Informed consent was sought and for those who consented were enrolled for the study. Data was collected using a structured questionnaire. The questionnaire was adapted from two studies, a study done in Kenya by King'oo, 2014 and a study done in Ghana by Jones Asafo Akowuah, 2016. These were modified and translated into Swahili. Each questionnaire had 5 sections.

Section A: contained socio-demographic characteristics; Age, marital status, occupation, level of education, number of living children.

Section B: contained accessibility to the healthy facility: time taken to the clinic, transport cost, initiation of ANC visit, total number of ANC visits, gestational age at commencing ANC, reasons for late or few ANC visits, time spent on waiting for the service and service satisfaction.

Section C: contained educational awareness for antenatal care services: ANC services importance to pregnant woman, ANC timing and adequate antenatal care visits.

Section D: contained socio-cultural factors: husband/partner education, occupation, awareness to ANC services, husband accompany to the clinic, decision to attend clinic

Section E: contained obstetric characteristics and pregnancy outcomes: parity, history of abortions, caesarean section, gestational hypertension, gestational diabetes, mode of delivery (vaginal/c/section), maternal deaths, alive fetus or still births, preterm or term deliveries, gestational age at delivery.

Exit interview was done privately to each participant using Swahili questionnaire before vacating the postnatal ward. Each questionnaire was given unique identifier. During the interviews, information on the booking gestation age, number of total antenatal care visits, fetal status if the participant had still birth and the gestational age at which the participant delivered was collected from the antenatal card.

2.12 Variables of the study

Independent variables of this study included socio-demographic factors (maternal age, education, marital status, occupation), socio-cultural factors (husband education and occupation, husband/partner knowledge to ANC services, husband/partner accompany to the ANC clinic, peer influence), obstetric factors (parity, booking gestational age, gestation age at delivery, prior history of abortions, caesarean sections, number of living children) and facility factors (time taken to the clinic, service satisfaction, time spent on waiting for the service). Dependent variables of this study were inadequate antenatal care visits and pregnancy outcomes (fetal outcomes; live or still births, preterm or term delivery and maternal outcomes; mode of delivery and maternal survival status (alive or deaths))

2.13 Data management

The principal investigator ensured that all questionnaires were kept safely throughout. Data collected were sorted and checked manually on a daily basis for their completeness and consistency. In case of any missing information or inconsistency, the principal investigator had to make necessary adjustments or corrections. Thereafter, data were coded manually, entered and cleaned in Statistical Package for Social Sciences (SPSS) version 23 for analysis.

2.14 Data analysis

Data were entered, cleaned and analysed using Statistical package for Social Sciences (SPSS) version 23. Post-delivery women with less than 4 ANC visits or started antenatal care visit after 16 weeks of pregnancy were considered to have inadequate antenatal care visits and excluded women who delivered before 36 weeks of pregnancy, since they were not due to have 4 or more ANC visits as per FANC guideline while those with ANC visits of 4 or more ANC visits or started ANC visit before 16 weeks of pregnancy were considered to have adequate antenatal care visits as per FANC guideline. Categorical variables were summarized using frequency distributions tables while continuous variables were summarised using measures of central tendency and variability such as mean and standard deviation. Statistical analysis using descriptive statistics was used to determine the prevalence of women with inadequate ANC visits and pregnancy outcomes such as mode of delivery, maternal survival status, preterm delivery and still births. The association between the dependent variable and independent variables were assessed using Odds ratio while chi-square and P-value was used as a measure of statistical significance. Bivariate and multivariate logistic regression were done to identify factors associated with inadequate antenatal care visits with a p-value <0.05 considered statistically significant.

2.15 Ethical issues

Ethical clearance was sought from the MUHAS Senate Research and Publication Committee. Research permission was obtained from the Director of Ubungo Municipality and from the Medical Officer In charge of Sinza hospital. The participants were thoroughly explained to about the research, its purpose, confidentiality and safety. Informed written consent was sought from every client who participated in the study. Participation was voluntary and participants were informed that they were free to withdraw at any time whenever they felt to do so. Those participants with inadequate antenatal care visits were educated on the importance of having adequate antenatal care visits and starting first antenatal care visit early before 16 weeks of pregnancy or even before 12 weeks of pregnancy.

3.0. RESULTS

During the study period, a total of 916 post-delivery women were discharged from the postnatal ward at Sinza hospital. Among these, 422 post-delivery were recruited into the study. Twenty nine women who delivered before 36 weeks of pregnancy were excluded, since they were not due for 4 or more ANC visits as per FANC guideline. Therefore 393 women met criteria and were analysed. Of these, 83 (21.1%) of post-delivery women had inadequate antenatal care visits.

Table 1: Socio-demographic characteristics of participants N=393

Variables	Total	Inadequate (%) n= 83	Adequate (%) n=310	Chi-square P-value
Age				
≤ 20	64	16(19.3)	48(15.5)	0.510
21- 34	276	54(65.1)	222(71.6)	
≥ 35	53	13(15.7)	40(12.9)	
Marital Status				
Single	82	21(25.3)	61(19.7)	0.263
Married	311	62(74.4)	249(80.3)	
Education level				
No formal education	16	7(8.4)	9(2.9)	0.028
Primary education	165	39(50.0)	126(40.7)	
Secondary education	151	30(36.1)	121(39.0)	
Higher education level	61	7(8.4)	54(17.4)	
Occupation				
Unemployed	144	33(39.8)	111(35.8)	0.795
Employed	53	11(13.3)	42(13.6)	
Self-employed	196	39(47.0)	157(50.7)	

Table 1 shows majority of women enrolled were married 311 (79.1%), aged between 21 to 34 years of age 276(70.2%) and were self-employed 196 (49.9%), also had primary education 165(42%). From the table, maternal education level (p-value = 0.028) showed a significant association with inadequate antenatal care visits while the rest did not show any significant association.

Table 2: obstetrics characteristics of the participants N=393

Variables	Total	Inadequate (%) n=83	Adequate (%) n=310	Chi-square P-value
Gestational age at booking				
< 12 weeks	34	1(1.2)	33(10.7)	0.000
12- 16 weeks	173	2(2.4)	171(55.2)	
>16 weeks	186	80(96.4)	106(34.2)	
Gestational age at delivery				
<37weeks	38	14(16.9)	24(7.74)	0.012
≥37 weeks	355	69(83.1)	286(92.3)	
Parity status				
Primipara	136	30(36.1)	106(34.2)	0.740
Multipara	257	53(63.9)	204(65.8)	
History of abortion(s)				
Yes	70	12(14.5)	58(18.7)	0.369
No	323	71(85.5)	252(81.3)	
History of caesarean section				
Yes	25	4(4.8)	21(6.8)	0.517
No	368	79(95.2)	289(93.2)	

Table 2 shows majority of women booked at gestational age after 16 weeks of pregnancy 186 (47.3%), most women delivered at term 355(90.3), majority of the participants were multipara 257(65.4%), majority had no history of abortions and caesarean sections 323 (82.2%) and 368(93.6%) respectively.

Gestational age at booking (p-value = 0.00) and gestational age at delivery (p-value = 0.012) showed significant association with adequate ANC visit while the rest did not show any significant association.

Table 3: Pregnancy outcomes among post-delivery women with inadequate and adequate ANC visits delivering at Sinza hospital, N=393

Variable	Inadequate ANC visits n=83 (%)	Adequate ANC visits n=310 (%)	Total	p-value
Fetal maturity				
Pre term	14(16.9)	24(7.7)	38	0.012
Term	69(83.1)	286(92.3)	355	
Mode of delivery				
Vaginal delivery	63(75.9)	227(73.2)	290	0.662
Caesarean section	20(24.1)	83(26.8)	103	
Fetal status				
Live birth	81(97.5)	306(98.7)	387	0.46
Still birth	2(2.6)	4(1.3)	6	

There was no maternal death that occurred during study period. From table 2: There was significant association of preterm delivery in women with inadequate antenatal care visits (p-value = 0.012). Women with inadequate antenatal care visits were two more likely to deliver preterm babies as compared to women with adequate antenatal care visits. Mode of delivery (vaginal or caesarean delivery) and fetal status (live or still birth) showed no any significant association with inadequate antenatal care visits.

Table 4: Bivariate association for factors associated with inadequate antenatal care visits among women delivering at Sinza hospital, N=393

Variables	Inadequate n=83	Adequate n=310	Total N=393	Chi-square P-Value
Gestational age at delivery				
Pre term	14(16.87)	24(7.74)	38	0.012
Term	69(83.13)	286(92.26)	355	
Mode of delivery				
Vaginal delivery	63(75.90)	227(73.23)	290	0.662
Caesarean section	20(24.10)	83(26.77)	103	
Fetal status				
Live birth	81(97.59)	306(98.71)	387	0.46
Still birth	2(2.41)	4(1.29)	6	
Age				
20 or less	16(19.28)	48(15.48)	64	0.51
21 to 34	54(65.06)	222(71.61)	276	
35 and above	13(15.66)	40(12.90)	53	
Occupation				
Unemployed	33(39.76)	111(35.81)	144	1.44
Employed	11(13.25)	42(13.55)	53	
Self employed	39(46.99)	157(50.65)	196	
Maternal education level				
No formal education	7(8.43)	9(2.90)	16	0.028
Primary education	39(46.99)	126(40.65)	165	
Secondary education	30(36.14)	12(39.03)	151	
Parity status				
Prime	30(36.14)	106(34.19)	136	0.74
Multipara	53(63.86)	204(65.81)	257	
History of caesarean section				
Yes	4(4.82)	21(6.77)	25	0.517
No	79(95.18)	289(93.23)	368	
Time taken to the clinic				
Less than 45min	67(80.72)	268(86.45)	335	0.191
45min above	16(19.28)	42(13.55)	58	

Time spent on waiting service				
Less than 1hr	14(16.87)	67(21.61)	81	0.224
2 to 4 hrs.	47(56.63)	186(60.00)	233	
Over 4hrs	22(26.51)	57(18.39)	79	
Total number of husband's accompany to ANC clinic				
None	24(28.92)	48(15.48)	72	0.004
Once	29(34.94)	95(30.65)	124	
2 or more	30(36.14)	167(53.87)	197	
Occupation of husband/partner				
Unemployed	3(3.61)	3(0.97)	6	0.086
Employed	7(8.43)	52(16.77)	59	
Self employed	73(87.95)	254(81.94)	327	
husband education level				
No formal education	2(2.41)	3(0.97)	5	0.369
Primary education	24(28.92)	75(24.19)	99	
Secondary education	45(54.22)	158(50.97)	203	
University	12(14.46)	74(23.87)	86	
Abortion history				
Yes	12(14.46)	58(18.71)	70	0.369
No	71(85.54)	252(81.29)	323	

From table 3: Maternal education (p-value= 0.028), total of number of times husband accompany his wife to the clinic (p-value = 0.004) and gestational age at delivery (p-value = 0.012) had a significant association with inadequate antenatal care visits. Other factors like occupation, prior history of caesarean sections, age, marital status and parity status had no significant association with inadequate antenatal care visits.

Table 5: Multivariate analysis for factors associated with inadequate antenatal care visits among women delivering at Sinza hospital.

Variables	COR	P-Value	95% C.I	AOR	P-Value	95% C.I
Education level						
No formal education	1					
Primary education	2.51	0.086	0.89 - 7.18	2.21	0.16	0.73 - 6.67
Secondary education	3.14	0.035	1.08 - 9.11	2.51	0.11	0.81 - 7.75
University	3.87	0.005	1.70 - 21.21	4.87	0.018	1.31 - 18.18
Husband awareness on ANC services						
No	1					
Yes	2	0.019	1.12 - 3.57	0.36	0.328	0.05 - 2.77
Husband accompany to the clinic						
Once	1					
Twice	1.63	0.132	0.86 - 3.11	4.83	0.126	0.64 - 36.29
Thrice or more	2.78	0.001	1.49 - 5.02	7.04	0.056	0.95 - 52.35
Gestational age at delivery						
Pre term	1					
Term	2.41	0.015	1.19 - 4.91	2.73	0.008	1.3 - 5.76

From table 4, maternal education especially university education (AOR (4.87), P-value (0.018), 95% C.I (1.31 - 18.18), total number of times a husband/partner accompanied his wife/ partner to the ANC clinic (AOR (7.04) P-value (0.005) C.I (0.95 - 52.35) and gestational age at delivery (AOR (2.73) P-value (0.008) CI 1.3-5.76) showed significant association with adequacy antenatal care visits among women delivering at Sinza hospital.

4.0. DISCUSSION

From this study about 21.1% of women delivering at Sinza hospital had inadequate care visits. Factors that showed significant association with inadequate antenatal care visits were maternal education, total number of times husband accompany to the clinic and gestational age at birth. There was a significant association of preterm delivery in women with inadequate antenatal care visits. Women with inadequate antenatal care visits were two times more likely to deliver preterm babies as compared to women with adequate antenatal care visits.

Results from this study suggest that a considerable proportion of post-delivery women (78.9%) had received adequate antenatal care services during pregnancy. It also shows that there is an increase in antenatal care services use among women as compared to the previous 54.8% (36) of women living in urban with 4 or more antenatal care visits during pregnancy. Using data from the 2015-2016 TDHS linked with administrative and health facility census data showed that only 51% of women had 4 or more ANC visits and 25% of women had started ANC visits before 12 weeks of pregnancy. The findings demonstrate that inadequate antenatal care visits is still a health problem as a quarter of post-delivery women had inadequate antenatal care visits. This finding also suggests that there may be missed opportunities for early diagnosis and interventions to pregnancy related complications since some women had inadequate antenatal visits.

The finding of 21.1% of women with inadequate antenatal care visits is lower to the findings observed in a research done in Tanzania, that observed 49% of pregnant women had inadequate antenatal care visits (8). The difference may be due to difference in data collection tools and study designs whereby the former was a community based cross sectional study limited to rural women while the current study was a hospital based cross sectional study limited to women living in urban. This may be due to difference in education level and poverty among women living in rural and urban area. Women living in urban areas may be more educated, low poverty and have access to many antenatal care clinics; this may stimulate good attendance to antenatal care clinics in women living in urban areas than those in rural areas who are less educated and have access to few or remote antenatal care clinics.

Also this proportion of women with inadequate antenatal care visits is slightly lower to study findings done in Canada of inadequate antenatal care that ranged from 25% to 43% in developing countries (13), and higher to that of developed countries on average does not

exceed 17% and to study done in USA in which the prevalence of inadequate care use of antenatal services was 11.2% (16). The difference could be due difference in ethnicity, culture, education level and degree of poverty between women living in developing countries and those living in developed countries. This could be the reason for the women in developed countries have higher likelihood of attending antenatal care services than those in living in developing countries because of many ANC clinics, well-staffed and equipped clinics. Also may be due to different study designs, the former studies were retrospective analytical and population studies respectively with large sample size while the current study was a descriptive cross sectional study with small sample size.

From the present study, maternal education level showed association with adequate antenatal care visits. Those women with higher education level were more likely to have adequate antenatal care visits than those with lower education level. This finding was similar to one observed in a study done in Zambia on inadequate antenatal visits that found to maternal educational status, decision-making power and income level among women (29). The similarity could be due to similar study designs and research tools. Maternal education is very important as it may help the woman understand the importance and need of ANC services during pregnancy and seek for the care early and more often. It may stimulate understanding and interaction between the health care provider and the client and hence good perception of the antenatal care services.

From the study, obstetric factors like parity, previous history of abortions, caesarean section or pregnancy complications showed no association with inadequate antenatal care visits. This finding was quite different from the finding observed in a study done in Zambia which stated that high parity, history of abortions and pregnancy complications were individual reasons for inadequate antenatal care visits (30). This difference could be due to different study settings and study tools, the former was a community based cross sectional study with large sample size and the current study was a hospital based cross sectional study with small sample size. High parity, history of abortions or caesarean section in a woman might have a positive impact on woman's habit of seeking medical care or antenatal care services more early and many times during pregnancy. This might lead adequacy in antenatal care visits.

From the current study, total number of times a husband/partner accompanied his wife/partner to the ANC clinic showed association with adequate antenatal care visits. These findings were similar to the findings observed in a study done in Uganda that found lack of

support from husband/partner was associated with inadequate antenatal care visit (32). Also another study done in Osun state Nigeria observed that husband unawareness of ANC services, husband acceptance and accompany to ANC services was a reason for inadequate antenatal care visits (25). The similarity could be due to the same culture, ethnicity and geographical area and also could be due to similarity in study designs, the former and the current studies were cross sectional studies. Husband/partner accompany to the ANC clinic makes a pregnant woman feel a sense of being loved and care for by her husband, but also stimulates the couple to start and attend ANC services for the Good health of the mother and their unborn baby.

From the present study, there was two times increased likelihood of preterm deliveries in women with inadequate antenatal care visits as compared to women with adequate antenatal care visits. This finding is similar to a study done in Ethiopia in which adverse pregnancy outcomes such like preterm birth, low birth weight, still births and small-for-gestational age were more in women with inadequate antenatal care visits (27). This was also similar to the study done in Canada that observed reduction of maternal mortality and the risk of miscarriage, premature birth, low birth-weight, still birth and sudden unexpected death in infancy in women with adequate use of antenatal care services (13). The reason for poor pregnancy outcomes may be due to the fact that women with inadequate antenatal care visits missed opportunities for antenatal care services and were not provided with nutritional advice, alert on warning or danger signs and lacked support for planning safe delivery.

4.1 Study strengths and limitations.

This was a hospital based study conducted only in postnatal ward of Sinza hospital, a municipal council hospital in urban area and thus limiting generalizability of its results to all health facilities in the country. Given the fact that documentation on the RCH 4 cards was sometimes not properly done, therefore gestation age at booking and delivery of some the participants could be inaccurate.

Unlike some other studies similar to this study, the research tool used for data collection was adapted from two studies. However, despite the study limitations, the data is reliable and valid to be used for subsequent studies.

5.0. CONCLUSION

Almost **one-fifth** of women delivering at Sinza hospital had inadequate care visits. Factors that showed significant association with adequacy antenatal care visits were maternal education, total number of times husband accompany to the clinic and gestational age at birth. There was a significant association of preterm delivery in women with inadequate antenatal care visits. Women with inadequate antenatal care visits were two times more likely to deliver preterm babies as compared to women with adequate antenatal care visits.

6. 0. RECOMMENDATIONS

Programs aimed at increasing public sensitization on the importance of antenatal care services among pregnant women should be emphasized. Public enlightenment, maternal and paternal education coupled with improving antenatal care services that may help reduce the magnitude of poor pregnancy outcomes, maternal and perinatal deaths.

More studies on the assessment of quality and components of ANC services should be done. More studies on assessment of husband/partner awareness on antenatal care services and their role in enhancing adequate antenatal care visits among pregnant women.

REFERENCES

1. WHO. WHO recommendations on antenatal care for a positive pregnancy experience. *Reprod Heal Publ.* 2016;3(2016):1–172.
2. Awasthi MS, Awasthi KR, Thapa HS, Saud B, Pradhan S, Khatry RA. Utilization of Antenatal Care Services in Dalit Communities in Gorkha , Nepal : A Cross-Sectional Study. *Res Artic.* 2018;2018.
3. Lincetto O, Mothebesoane-anoh S, Gomez P, Munjanja S. Antenatal Care. *Oppor Africa's Newborn.* 2015;(2015):51–62.
4. Heaman MI, Newburn-cook C V, Green CG, Elliott LJ, Helewa ME. BMC Pregnancy and Childbirth Inadequate prenatal care and its association with adverse pregnancy outcomes : A comparison of indices. *Rearch artile.* 2008;8(May, 2008):1–8.
5. Id TT, Chojenta C, Smith R, Loxton D. Factors affecting utilization of antenatal care in Ethiopia : A systematic review and meta- analysis. *Res Artic.* 2019;(April,2019):1–24.
6. Verma D, Rathore AM, Manaktala U. Inadequate antenatal care in women attending tertiary care hospital for delivery: Causes and consequences. 2016;IJBR (2013(October 2013):2–8.
7. Teplitskaya AL, Dutta A, Saint-firmin P, Wang Z. Maternal Health Services in Tanzania : Det
erminants of Use and Related Financial Barriers from 2015-16 Survey Data. *Matern Child Heal Artic.* 2018;(May 2018):1–12.
8. Kinney AM V, Kerber KJ, Black RE, Cohen B, Nkrumah F, Friberg AIK, et al. Africa ' s Mothers , Newborns and. *Res Artic Reprod Heal.* 2010;7(June, 2010):1–24.
9. Choe S, Kim J, Kim S, Park Y, Kullaya SM, Kim C. Do antenatal care visits always contribute to facility-based delivery in Tanzania ? A study of repeated cross-sectional data. *Res Artic.* 2016;31(June 2015):277–84.
10. Debessai Y, Costanian C, Roy M, Tamim H. Inadequate prenatal care use among Canadian mothers : fi ndings from the Maternity Experiences Survey. *Nat Publ Gr [Internet]. Nature Publishing Group;* 2016;(September 2015):1–7. Available from: <http://dx.doi.org/10.1038/jp.2015.218>
11. Surkan PJ, Teresa M, Bassani DG, J CP, A MT. Inadequate Use of Prenatal Services Among Brazilian Women : The Role of Maternal Characteristics. *Artic Sex Reprod Heal.* 2009;35(1):15–20.
12. WHO. World health statistics 2018: monitoring health for the SDGs, sustainable development goals. 2018. 1-100 p.
13. Debessai Y, Costanian C, Roy M, Tamim H. Inadequate prenatal care use among Canadian mothers : fi ndings from the Maternity Experiences Survey. *Nat Publ Gr. Nature Publishing Group;* 2016;(September 2015):1–7.
14. Focused Antenatal Care in Tanzania. COUNTRY-LEVEL Program 2014. 2014;(2014):1–13.
15. Halle-ekane GE, Halle-ekane GE, Fotabong CM, Njotang PN, Atashili J, Bechem NN, et al. WOMEN ' S HEALTH Quality of Antenatal Care and Outcome of Pregnancy in a Semi-Urban Area in Fako Division , Cameroon : A Cross-Sectional Study. *Rearch artile women Heal.* 2015;1(sept, 2015):31–9.

16. Partridge S, Balayla BSJ. Inadequate Prenatal Care Utilization and Risks of Infant Mortality and Poor Birth Outcome : A Retrospective Analysis of 28 , 729 , 765 U . S . Deliveries over 8 Years. *Artic Am J Perinatol*. 2014;29 No. 10/(July 2012):788–93.
17. Linard M, Blondel B, Estellat C, Deneux-tharoux C, Luton D, Oury JF, et al. Association between inadequate antenatal care utilisation and severe perinatal and maternal morbidity : an analysis in the PreCARE cohort. *An Int J Obstet Gynaecol*. 2018;(Agust,2017):587–95.
18. Raatikainen K, Heiskanen N, Heinonen S. Under-attending free antenatal care is associated wth adverse pregnancy outcomes. *Resaarch Artic public Heal*. 2007;8(sept, 2007):1–8.
19. Jong EIF, Jansen DEMC, Baarveld F, Schans CP Van Der. Determinants of late and / or inadequate use of prenatal healthcare in high-income countries : a systematic review. *Eur J Public Health*. 2011;22(6):904–13.
20. Chiavarini M, Lanari D, Minelli L, Salmasi L. Socio-demographic determinants and access to prenatal care in Italy. *BMC Health Serv Res*. 2014;(2014):1–10.
21. Vanden Broeck J, Feijen-De Jong E, Klomp T, Putman K, Beeckman K. Antenatal care use in urban areas in two European countries: Predisposing, enabling and pregnancy-related determinants in Belgium and the Netherlands. *BMC Health Serv Res*. *BMC Health Services Research*; 2016;16(2016):1–11.
22. Tuladhar H, Dhakal N. Impact of Antenatal Care on Maternal and Perinatal utcome : A Study at Nepal Medical College Teaching Hospital. *Res Artic*. 2011;6(2):37–43.
23. Ali SA, Dero AA, Ali SA, Ali GB. Factors affecting the utilization of antenatal care among pregnant women : A literature review . *Utilization of. J pregnancy neonatal Med*. 2018;2(2):41–5.
24. Hajizadeh S, Tehrani FR, Simbar M, Farzadfar F. Factors Influencing the Use of Prenatal Care : A Systematic Review. *J midwifery Reprod Heal*. 2015;1(2015):1–14.
25. Olayinka A, Joel A, Bukola D. Factors influencing utilization of antenatal care services among pregnant women in Ife Central Lga , Osun State Nigeria National Hospital Abuja , Nigeria. *Adv Appl Sci Res J*. 2012;3(3):1309–15.
26. Kaswa R, Rupesinghe GFD, Longo-mbenza B, Sisulu W, Africa S, Africa S, et al. Exploring the pregnant women ' s perspective of late booking of antenatal care services at Mbekweni Health Centre in Eastern Cape , South Africa. *African J Prim Heal Care Fam Med*. 2018;1(2018):1–9.
27. Yohannes Dibaba MF and MJH. The effects of pregnancy intention on the use of antenatal care services : systematic review and meta-analysis. *Res Artic Reprod Heal*. 2013;(2013):1–9.
28. Yimer NB, Tenaw Z, Solomon K, Mulatu T. Inadequate Prenatal Visit and Home Delivery as Determinants of Perinatal Outcomes : Does Parity Matter ? *J Pregnancy*. 2019;2019(2019):9.
29. Care A, Tabor D, Care A, Tabor D. *Gynecology & Obstetrics*. *Res Artic*. 2015;5(January):1–5.
30. Paper O. Factors Associated with late Antenatal Care Attendance in Selected Rural and Urban Communities of the Copperbelt Province of Zambia. *Med J Zambia*. 2012;39(3):29–36.

31. Gitobu CM, Gichangi PB, Mwanda WO. The effect of Kenya ' s free maternal health care policy on the utilization of health facility delivery services and maternal and neonatal mortality in public health facilities. *Res Artic pregnancy childbirth. BMC Pregnancy and Childbirth*; 2018;(2018):1–11.
32. Anastasi E, Borchert M, Campbell OMR, Sondorp E, Kaducu F, Hill O, et al. Losing women along the path to safe motherhood : why is there such a gap between women ' s use of antenatal care and skilled birth attendance ? A mixed methods study in northern Uganda. *BMC Pregnancy Childbirth [Internet]. BMC Pregnancy and Childbirth*; 2015;1(2015):1–15. Available from: <http://dx.doi.org/10.1186/s12884-015-0695-9>
33. Gupta S, Yamada G, Mpembeni R, Frumence G, Callaghan-koru JA. Factors Associated with Four or More Antenatal Care Visits and Its Decline among Pregnant Women in Tanzania between 1999 and 2010. *Four Antenatal Visit among Tanzanian Women*. 2015;9(7):1–13.
34. Gross K, Alba S, Glass TR, Schellenberg JA, Obrist B. Timing of antenatal care for adolescent and adult pregnant women in south-eastern Tanzania. *Res Artic*. 2012;1(2012):1–12.
35. Njiku F, Wella HL, Sariah A, Protas J. Prevalence and factors associated with late antenatal care visit among pregnant women in Lushoto , Tanzania. *Tanzan J Health Res*. 2017;19(3):1–6.
36. Survey H, Survey MI, Findings K. Tanzania. 2015-16 Demogr Heal Surv Malar Indic Surv. 2015;(febr 14, 2016):1–24.
37. Anastasi E, Borchert M, Campbell OMR, Sondorp E, Kaducu F, Hill O, et al. Losing women along the path to safe motherhood : why is there such a gap between women ' s use of antenatal care and skilled birth attendance ? A mixed methods study in northern Uganda. *BMC Pregnancy Childbirth. BMC Pregnancy and Childbirth*; 2015;1(2015):1–15.
38. Gupta R. *Journal of Neonatal Biology Frequency and Timing of Antenatal Care Visits and Its Impact on Neonatal Mortality in EAG States of India*. 2017;6(3):1–7.

APPENDICES**Appendix 1: Consent Form-English Version****RESEARCH TOOLS****DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY****MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES (MUHAS)****CONSENT TO PARTICIPATE IN A BIO-MEDICAL RESEARCH**

Factors associated with inadequate antenatal care visits and pregnancy outcomes among women delivering at Sinza hospital from November to December 2019.

Code No: _____

PART I: INFORMATION

Dear Participant

My name is Daniel Luguli I would like to invite you to participate in this research that intends to determine factors associate with inadequate antenatal care visits and pregnancy outcomes among women delivering at Sinza Hospital

Aim: The aim of this study is to determine the proportion and factors associated with inadequate antenatal care visits and pregnancy outcomes among women delivering at Sinza hospital

Participation: Principal investigator or research assistants, after you have consented to participate, will interview you using questionnaire. Other information may be obtained from your RCH card 4.

Confidentiality: All the information obtained will be kept confidential and they will only be used for intended study aim. No any write up or publication of this study where your name or other identity will be displayed.

Right to withdrawal: Your participation to this study is voluntary and you may get out of the study any moment you wish after you have consented and no penalty shall be imposed to you.

Benefits: There is no financial incentive upon your participation to this study. The findings of the study will be used as evidence based information to suggest strategies and review policies and standards on increasing antenatal care use among pregnant women, and hence promote women and child health.

Injury/Harm: The study will not in any way affect your plan of management for your condition. We do not expect any harm to you as a result of your participation to this study.

Who to contact: For any inquiry regarding this study please contact Dr. Daniel Luguli, resident doctor in Obstetrics and Gynaecology Department at Muhimbili University of Health and Allied Sciences (MUHAS), the principal investigator of this study; P.O Box 65001, Dar es Salaam, mobile +255 754 536 811/ 655 536 811

For any questions pertaining to rights as a research participant, contact Dr. Bruno Sunguya, the Director of Research and Publications Committee at MUHAS; P.O. Box 65001, Dar es Salaam, Tel: +255 222 150 302-6/2152489.

PART II: CERTIFICATE OF CONSENT

I, _____ have read the above information/it has been read to me. I have had the opportunity to ask questions about it and any questions I asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study.

Signature of the participant _____

Signature of researcher _____

Date of signed consent _____

Appendix 2: Questionnaire-English Version

QUESTIONNAIRE -ENGLISH VERSION

Kindly fill in the questionnaire below. The information given will be treated with utmost confidence and will only be used for the purposes of this academic study.

SECTION A: BIO –DATA (Tick or fill the space provided as appropriate)

- i. Age
- ii. Marital status
Single married cohabiting divorced
- iii. Education level
No formal education primary secondary university
- iv. Occupation
Housewife government employee self-employee
- v. Number of living children
- vi. Parity

SECTION B: ACCESSIBILITY TO HEALTHY FACILITY

- i. How long does it take to reach the healthy facility? min/hrs.
- ii. Is it costful for you to reach the healthy facility? yes no
- iii. How many times did you attend the RCH clinic?
Nil once 2-3 times 4 or more
- iv. If nil, attended once or 2-3 times, what were the reasons for such few attendances
Fear for HIV testing
Unawareness of the importance of ANC
Long distance to the ANC clinic
Unawareness of the pregnancy itself
Husband/partner not ready to escort you to the clinic
Husband/partner doesn't allow you to attend the clinic
Poor services/delayed services at the clinic
- v. At what gestational age did you make your first antenatal clinic?
Below 16 weeks
Between 16-24 weeks
Above 24 weeks
- vi. If more than 16 weeks of gestation, what were the reasons for late booking?
Fear for HIV testing
Unawareness of importance of early ANC initiation
Long distance to the clinic
Unmarried status
Husband/ partner not ready to escort you to the clinic
Husband/partner doesn't allow you to attend the clinic
Others

- vii. What was the average amount of time that you waited to see medical staff when you visited the clinic?
 Less than 1hour 2-4 hours more than 4 hours
- viii. Were you satisfied with the services provided at ANC clinic?
 Yes no

SECTION C: EDUCATIONAL AWARENESS OF ANTEANATAL CARE SERVICES

- I. Are antenatal care services important to a pregnant woman? Yes no
- II. If yes, what is the importance of antenatal care services to pregnant women?
 Helps in the early diagnosis and treatment of diseases in pregnant women
 Helps improve health of pregnant women
 Helps pregnant women do birth preparedness
 Others.....
- III. At what gestational age did you start antenatal clinic?
- IV. How many antenatal visits did you make?

SECTION D: SOCIOCULTURAL FACTORS

- I. What is the education level of your husband/partner?
 No formal education primary secondary university
- II. What is the occupation of your husband/partner?
 Peasant government employee self-employed
- III. Is your husband/partner aware of antenatal care services? yes no
- IV. Did you need to get a husband/ partner approval for you to attend antenatal care services? yes no
- V. Did your husband/ partner ever accompany you to antenatal clinic? Yes no
- VI. If yes, how many times di he accompany you?
- VII. If no, what were the reasons that made your husband/partner not to accompany to ANC clinic?
 He doesn't know the importance of ANC
 Fear for HIV testing
 He is less concerned with ANC issues
 Others
- VIII. Do your relatives, friends or neighbours discourage you from attending the ANC clinic? yes no

OBSTETRIC FACTORS AND PREGNANCY OUTCOME

- I. Do you have any history of previous caesarean section? Yes no
- II. Do you have any history of abortion(s)? yes no
- III. Do you have any history of obstetric complications like gestational diabetes or hypertension, anemia? Yes no
- IV. What is your parity?
- V. What is your mode of delivery?
 Vaginal delivery caesarean section

VI. Pregnancy outcome

Live birth []

Still birth [] fresh [] macerated []

VII. What was the gestational age during delivery? weeks

NB. Please use the mother RCH card to get the total number of visits, gestational age at booking and delivery, to confirm fetal status after still birth.

Appendix 3: Consent Form Swahili Version**SHULE YA UTABIBU****IDARA YA UZAZI NA MAGONJWA YA WANAWAKE****CHUO KIKUU CHA AFYA NA SAYANSI SHIRIKISHI MUHIMBILI****FOMU YA RIDHAA KUSHIRIKI KATIKA UTAFITI WA DAWA TIBA**

Utafiti kuhusu sababu zinazohusiana namatumizi hafifu ya huduma ya kiliniki ya wajawazito na matokeo ya ujauzito kwa kinamama wanaojifungua katika hospitali ya Sinza.

Namba Ya Utambulisho:

SEHEMU YA I: TAARIFA

Habari, naitwa Dkt. Daniel Luguli, napenda kukushukuru kwa kushiriki kwenye mahojiano haya. Ninafanya utafiti kuhusu sababu zinazohusiana namatumizi hafifu ya huduma ya kiliniki ya wajawazito na matokeo ya ujauzito kwa kina mama wanaojifungua katika hospitali ya Sinza.

Lengo: Kuthathmini na kujuas ababu zinazohusiana na matumizi hafifu ya huduma ya kiliniki ya wajawazito na kujua matokeo ya ujauzito kwa kina mama wanaojifungua katika hospitali ya Sinza.

Ushiriki: Mtafitimkuu/msaidizi, baada ya kupata ridhaa yako ya kushiriki, atakuhoji kwa kutumia dodoso. Pia taarifa nyingine zinaweza kupatikana kutoka kadi yako ya kiliniki ya wajawazito.

Usiri: Taarifa zote zitakazopatikana zitahifadhiwa kwa usiri na zitatumika kwa ajili ya lengo la utafiti. Jina lako au utambulisho wako hautatokea kwenye maandishi au machapisho yoyote ya utafiti huu.

Hakiyakujitoa: Ushiriki wako kwenye utafiti huu ni wa hiari na unaweza kujitoa kwenye utafiti huu wakati wowote baada ya kukubali, hakuna adhabu yoyote itakayotozwa juu yako.

Faida: Hakuna motisha ya kifedha juu ya ushiriki wako kwenye utafiti huu; hata hivyo ushiriki wako ni muhimu katika kutimiza lengo la utafiti huu kwakuwa matokeo ya utafiti huu yatakuwa chanzo cha taarifa katika kushauri mikakati mbalimbali na kupitia upya sera na viwango katika kuboresha na kuongeza matumizi ya huduma ya kiliniki ya wajawazito kwa kinamama wajawazito, na hivyo kuboresha afya ya mama na mtoto.

Kuumia/Madhara: Utafiti huu hautaathiri upatikanaji huduma za kiafya kwako. Hatutarajii madhara yoyote kwako, au kwa familia yako, au kwa wasaidizi wako kutokana na ushiriki wako katika utafiti huu.

Kwamawasiliano: Endapo utakua na swali lolote linalohusu utafiti huu, wasiliana na wafuatao: Dkt. Daniel Luguli (Mtafitimkuu), mwanafunzi wa Shahada ya Uzamili Idara ya Uzazi na Magonjwa ya Wanawake, Chuo Kikuu cha Afya na Sayansi Shirikishi Muhimbili, S.L.P.65001, Dares Salaam. Simu +255 754 536 811/ 655 536 811.

Kwa maswali kuhusu haki zako kama mshiriki, unaweza kuwasiliana na Dkt. Bruno Sunguya, Mwenyekiti wa Kitengo cha Utafiti, Chuo Kikuu cha Afyana Sayansi Shirikishi Muhimbili, P.O.Box 65001, Dar es Salaam. Simu: +255 222 150 302-6/2152489.

SEHEMU YA II: CHETI CHA RIDHAA

Mimi nimesoma (nimesomewa) taarifa hii kama ilivyoelezwa hapo juu. Nimepata nafasi ya kuuliza maswali na nimejibiwa na nimeridhika. Nimeelewa dhumuni la utafiti huu. Ninakubali/ninaridhia kwa hiari yangu kushiri kikatika utafiti huu.

Sahihi ya mtoa huduma za afya _____

Sahihi ya mtafiti _____

Tarehe _____

Appendix 4: Dodoso

Tafadhali jaza maswali yafuatayo. Taarifa utakazozitoa ni siri na zitatunzwa kwa usiri mkubwa. Aidha taarifa hizi zitatumika kwa ajili ya matumizi ya kielimu tuu.

SEHEMU A: chagua jibu lililo sahihi au jaza sehemu iliyo wazi

- i. Umri wako ni miaka
- ii. Hali ya ndoa
Sijaolewa [] Nimeolewa [] nimechumbiwa [] nimeachika []
- iii. Kiwango cha elimu yako ni;
Sijasoma [] msingi [] sekondari [] chuo kikuu []
- iv. Kazi yako ni;
Mama wa nyumbani [] mtumishi wa serikali [] mfanyabiashara [] nimejiari []
- v. Una watoto wangapi waliohai.....
- vi. Umezaa mara ngapi.....

SEHEMU B:

- i. Unatumia muda gani kufika hospitali tokea nyumbani
Masaa
- ii. Je unatumia gharama kufika hospitali ukitokea nyumbani kwako
Ndiyo..... hapana.....
- iii. Ulihudhuria kliniki mara ngapi wakati wa ujauzito uliopita
Sikuhudhuria kabisa [] mara 1 [] kati ya mara 2-3 [] mara 4 au zaidi []
- iv. Kama hukuhudhuriakabisa au ulihudhriakatiyamara 1, 2 hadi 3, unadhani nini ni sababu za kukufanya usihudhurie kiliniki ipasavyo
Sababu ya kuogopa upimaji wa VVU []
Sababu ya kutokujua umuhimu wa kiliniki []
Umbali wa kliniki ilipo tokea nyumbani []
- v. Ulianza kuhudhuria kliniki kwa mara ya kwanza wakati ujauzito una umri gani?
Chini ya wiki 16 [] kati ya 16 hadi 24 [] zaidi ya wiki 24
Kama ni zaidi ya wiki 16, nini sababu zakuchelewa kuanza kiliniki
Sababu ya kuogopa kupima VVU []
Sababu ya kutokujua umuhimu wa kuanza kiliniki mapema []
Umbali wa kliniki ilipotokea nyumbani []

vi. Ulikuwa inachukua muda gani wakati unasubiria huduma ukiwa kiliniki

Chini ya saa 1 [] masaa 2 hadi 4 [] zaidi ya masaa 4 []

vii. Je unaridhishwa na huduma za kiliniki

Ndiyo [] hapana []

SEHEMU C

i. Je unadhani huduma za kiliniki ya uzazi ni muhimu kwa mjamzito?

Ndio [] hapana [] sijui []

ii. Nini faida au umuhimu wa huduma za kliniki ya wajawazito?

Sijui []

Husaidia kugundua na kutibu magonjwa kwa wajawazito []

Husaidia kuboresha afya ya mjamzito na mtoto []

Humsaidia mjamzito kujiandaana uzazi []

iii. Je ulianza kwenda kiliniki wakati mimba ina umri gani.....

iv. Je ulihudhuria kiliniki mara ngapi kipindi chote cha ujauzito.....

SEHEMU D

i. Kiwango cha elimu cha mume au mchumba wako ni

Hajasoma [] msingi [] sekondari [] chuokikuu []

ii. Kazi ya mume au mchumba wako ni

Mkulima [] Mtumishi wa umma [] mfanyabiashara [] kajajiri []

iii. Je mume au mchumba wako anaelewa umuhimu wa huduma za kiliniki ya

wajawazito? Ndio [] hapana [] sijui []

iv. Je ilikuwa lazima upate ruhusa ya mume au mchumba wako ili uweze kuhudhuria

Kiliniki ya wajawazito? Ndio [] hapana []

v. Je mume au mchumba wako alishawahi kukusindikiza kiliniki ya wajawazito?

Ndio [] hapana []

vi. Kama ndio, aliwahi kukusindikiza mara ngapi.....

vii. Je ni wewe pekee unaehusika na kufanya maamuzi ya kuhudhuria kiliniki?

Ndiyo [] Hapana []

viii. Kama hapana, ni nani anaehusika na maamuzi hayo

SEHEMU E:

- i. Je una historia ya kuzaa kwa upasuaji kwa mimba zilizopita.....
- ii. Je una historia ya mimba kuharibika.....
- iii. Je una historia ya shinikizo la damu/ kifafa cha mimba ,upungufu wa damu au kisukari kwa mimba zilizopita.....
- iv. Uzaohuuniwangapi.....
- v. Umejifungua kwa njia gani njia ya kawaida [] njia ya upasuaji []
- vi. Nini matokeo ya ujauzito uliopita
Nimezaa mototo hai [] nimezaa motto mfu [] Mtoto mfu amekoboka []

Mtoto mfu hajakoboka []
- vii. Umri wa mimba wakati wa kujifungua ni wiki.....

NB: tumia kadi ya kiliniki ya mama ya ujauzito ili kuona idadi ya madhudhurio yote ya kiliniki, umri wa mimba wakati wa hudhurio la kwanza kiliniki, kujua umri wa mimba wakati wa kujifungu na kujua kama mtoto amekoboka au la ikiwa amezaa mtoto mfu.

Appendix 5: Ethical Clearance

**MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR OF POSTGRADUATE STUDIES**

P.O. Box 65001
DAR ES SALAAM
TANZANIA
Web: www.muhas.ac.tz



Tel G/Line: +255-22-2150302/6 Ext. 1015
Direct Line: +255-22-2151378
Telefax: +255-22-2150465
E-mail: dpgs@muhas.ac.tz

Ref. No. DA.287/298/01A/

2nd September, 2019

Dr. Daniel Simon Luguli
MMed. Obstetrics and Gynaecology
MUHAS.

RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED: "FACTORS ASSOCIATED WITH INADEQUATE ANTENATAL CARE USE AND PREGNANCY OUTCOMES AMONG WOMEN DELIVERING AT SINZA HOSPITAL"

Reference is made to the above heading.

I am pleased to inform you that, the Chairman has, on behalf of the Senate, approved ethical clearance for the above-mentioned study. Hence you may proceed with the planned study.

The ethical clearance is valid for one year only, from **30th September, 2019 to 29th September, 2020**. In case you do not complete data analysis and dissertation report writing by **29th September, 2020**, you will have to apply for renewal of ethical clearance prior to the expiry date.


Dr. Emmanuel Balandya
ACTING: DIRECTOR OF POSTGRADUATE STUDIES

cc: Director of Research and Publications
cc: Dean, School of Medicine

Appendix 6: Research Permit

UBUNGO MUNICIPAL COUNCIL

ALL CORRESPONDENCES TO BE ADDRESSED TO THE MUNICIPAL DIRECTOR

Tel: 0222-926341
Fax: 0222-926342



E mail info@ubungomc.go.tz
Website: www.ubungomc.go.tz
In reply please quote:

P. O. BOX 55068
DAR ES SALAAM.

DATE: 20/09/2019

Ref. AB.27/333/01

Dr. Daniel Simon Luguli,
Muhimbili University of Health and Allied Sciences,
Office of the Director of Postgraduate Studies,
P.O. Box 65001,
DAR ES SALAAM.

RE: RESEARCH PERMIT

Refer to the above heading.

I am pleased to inform you that your above request has been considered by the Municipal Director, and has offered you a place to research attachment.

I am pleased to inform you that your above request has been considered by the Municipal Director, and has offered you a place to research attachment from **22 September, 2019 to 22 January, 2020**. Concerning **"Factors Associated with inadequate antenatal care use and pregnancy outcomes among women delivering at Sinza Hospital.**

During the period of research you are required to obey the rules and regulations of the institution.

Yours Sincerely,

B. A. Mwamende
For: **THE MUNICIPAL DIRECTOR**
UBUNGO

For: MUNICIPAL DIRECTOR
UBUNGO MUNICIPAL COUNCIL
DAR-ES-SALAAM

Copy: Director Postgraduate Studies,
Muhimbili University of Health and Allied Sciences,
Office of the Director of Postgraduate Studies,
P.O. Box 65015,
DAR ES SALAAM.